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GenCore version 5.1.6  
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OM nucleic - nucleic search, using sw model

Run on: June 17, 2003, 11:16:03 ; Search time 236.058 Seconds  
(without alignments)  
10331.847 Million cell updates/sec

Title: US-09-807-933B-6

Perfect score: 1083

Sequence: 1 atgaagttccttaccattgc.....ctggctgttcaagaataa 1083

Scoring table: IDENTITY NUC

Gap 10.0 , Gapext 1.0

Searched: 2185239 seqs, 112599159 residues

Total number of hits satisfying chosen parameters: 4370478

Minimum DB seq length: 0

Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%

Database : Listing first 45 summaries

1: /SID82/gcgdata/geneeq/geneeqn-emb1/NA1980.DAT.\*  
2: /SID82/gcgdata/geneeq/geneeqn-emb1/NA1981.DAT.\*  
3: /SID82/gcgdata/geneeq/geneeqn-emb1/NA1982.DAT.\*  
4: /SID82/gcgdata/geneeq/geneeqn-emb1/NA1983.DAT.\*  
5: /SID82/gcgdata/geneeq/geneeqn-emb1/NA1984.DAT.\*  
6: /SID82/gcgdata/geneeq/geneeqn-emb1/NA1985.DAT.\*  
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9: /SID82/gcgdata/geneeq/geneeqn-emb1/NA1988.DAT.\*  
10: /SID82/gcgdata/geneeq/geneeqn-emb1/NA1989.DAT.\*  
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21: /SID82/gcgdata/geneeq/geneeqn-emb1/NA2000.DAT.\*  
22: /SID82/gcgdata/geneeq/geneeqn-emb1/NA2001A.DAT.\*  
23: /SID82/gcgdata/geneeq/geneeqn-emb1/NA2001B.DAT.\*  
24: /SID82/gcgdata/geneeq/geneeqn-emb1/NA2002.DAT.\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

# SUMMARIES

Result No.	Score	Query Match	Length	ID	Description
1	1083	100.0	1083	21	AAA62728
2	1083	100.0	1083	24	AAA62726
3	519.2	47.9	1017	21	AAA62726
4	519.2	47.9	1017	24	AAA62726
5	519	47.9	1101	21	AAA62727
6	519	47.9	1101	24	AAA62727
7	404.6	37.4	1017	21	AAA62729
8	404.6	37.4	1017	24	AAA62729
9	398.6	36.8	1164	21	AAA62730

10	398.6	36.8	1164	24	AAA62728
11	363.4	33.6	1041	21	AAA62731
12	363.4	33.6	1041	24	AAA62731
13	362.4	33.5	1043	21	AAA62732
14	362.4	33.5	1043	24	AAA62732
15	218.2	20.1	1473	12	AAQ14857
16	218.2	20.1	1473	13	AAQ26407
17	218.2	20.1	1473	13	AAQ26382
18	218.2	20.1	1473	13	AAQ25933
19	218.2	20.1	1473	13	AAQ29935
20	218.2	20.1	1473	14	AAQ49942
21	218.2	20.1	1473	16	AAQ60179
22	218.2	20.1	1473	19	AAV16103
23	216.6	20.0	1473	14	AAQ41733
24	215.6	19.9	984	19	AAV16105
25	205.4	19.0	1423	17	AAV39049
26	195	18.0	928	19	AAV15072
27	184.4	17.0	922	19	AAV15073
28	184.4	17.0	922	17	AAV39050
29	181	16.7	1174	19	AAV39056
30	181	16.7	1174	19	AAV39062
31	178.2	16.5	927	17	AAV39047
32	178	16.4	960	17	AAV39047
33	177	16.3	894	17	AAV39061
34	171.8	15.9	1261	19	AAV3748
35	170.2	15.7	913	17	AAV39051
36	168.4	15.5	885	17	AAV39075
37	162.4	15.0	1060	13	AAQ30072
38	162	15.0	672	24	AAV43263
39	162	15.0	672	24	AAV43263
40	161.8	14.9	1058	13	AAQ26405
41	161.8	14.9	1060	12	AAQ14856
42	161.8	14.9	1060	13	AAQ26380
43	161.8	14.9	1060	13	AAQ25932
44	161.8	14.9	1060	13	AAQ29934
45	161.8	14.9	1060	13	AAQ30067

## ALIGNMENTS

RESULT 1	AAA62728	standard; DNA; 1083 BP.
ID	AAA62728	
XX	AAA62728;	
AC	25-SEP-2000 (first entry)	
XX		
DT	Endoglucanase nucleotide sequence 3.	
XX		
DE	Endoglucanase: cellulose breakdown; produce pulp; papermaking;	
XX		
KW	animal foodstuff; ss.	
KW		
OS	Rhizopus oryzae.	
XX		
PN	WO200024879-A1.	
XX		
PD	04-MAY-2000.	
XX		
PF	25-OCT-1999; 99WO-JP05884.	
XX		
PR	23-OCT-1998; 98JP-0302387.	
XX		
PA	(MEIJU) MEIJU SEIKA KAISHA LTD.	
XX		
PI	Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;	
PI	Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;	
XX		
DR	WPI; 2000-365117/31.	
XX		
PT	P-PSDB; AAB09823.	
XX		
XX	Endoglucanases of fungal origin with high activity under alkaline	

Rhizopus arrhizus  
Endoglucanase nucl  
Phycomyces nitens  
Endoglucanase nucl  
Rhizopus arrhizus  
Fusarium oxysporum  
Fusarium oxysporum  
Endoglucanase #2.  
Cellulase contine  
Endoglucanase gene  
F. oxysporum endog  
Fusarium oxysporum  
Dye transfer inhib  
Fusarium oxysporum  
CDNA encoding cell  
Hybrid DNA compis  
Hybrid DNA compis  
CDNA encoding cell  
Monocomponent endo  
Chimeric endogluca  
CDNA encoding cell  
Chimeric endogluca  
Humicola grisea ce  
CDNA encoding cell  
Chimeric endogluca  
43kd endoglucanase  
Humicola insolens  
Humicola insolens  
Humicola insolens  
Humicola insolens  
Endoglucanase #1.  
Cellulase contine  
Endoglucanase gene  
Sequence encoding

PT conditions for production of paper pulp and animal feedstuffs -  
 XX Claim 44; Page 113-115; 180pp; Japanese.

XX This sequence encodes an endoglucanase protein. The invention relates  
 XX to an endoglucanase of fungal origin which can completely break down  
 CC purified cellulose at a concentration of less than 1mg protein/litre,  
 CC and produces more than 50% breakdown of cellulose at pH 8.5. The  
 CC invention includes endoglucanase protein sequences (see  
 CC AAB09825-B09830), endoglucanase nucleotide sequences (see  
 CC AAB09825-A62732) and primers (AAB62733-A62802) which are used in the  
 CC identification of the endoglucanase sequences, and in the construction of  
 CC vectors containing the polynucleotides. The endoglucanase enzymes are  
 CC used for the production of pulp for papermaking and for the production of  
 CC animal feedstuffs.

XX Sequence 1083 BP; 260 A; 297 C; 231 G; 295 T; 0 other;

SQ Query Match 100.0%; Score 1083; DB 21; Length 1083;

Best Local Similarity 100.0%; Pred. No. 5,6e-302;  
 Matches 1083; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 ATGAAGTTCCTTACCATTCCTCTCCGCTATCTTGCGACATTCGCGGTGTAAGTGA 60  
 DB 1 ATGAAGTTCCTTACCATTCCTCTCCGCTATCTTGCGACATTCGCGGTGTAAGTGA 60  
 QY 61 GCCCATGCTGCTGAATGTGAGAGAGGCTTACCAATGTGTGTAAGTGA 120  
 DB 61 GCCCATGCTGCTGAATGTGAGAGGCTTACCAATGTGTGTAAGTGA 120  
 QY 121 CCTACCTGCTGTAATCTGCGCTTACCTTGCGTATCTTGCAATCTTCTACTCC 180  
 DB 121 CCTACCTGCTGTAATCTGCGCTTACCTTGCGTATCTTGCAATCTTCTACTCC 180  
 QY 181 CAATGTGTTCCCAAGAAAGAACTCACTCCACTCAAAATCTTCTCAAAACCACT 240  
 DB 181 CAATGTGTTCCCAAGAAAGAACTCACTCCACTCAAAATCTTCTCAAAACCACT 240  
 QY 241 ACTGAGGTGCCAAGAAAGAACTCACTCAAAAGTTCCCAAGAAAGCACTACTGAA 300  
 DB 241 ACTGAGGTGCCAAGAAAGAACTCACTCAAAAGTTCCCAAGAAAGCACTACTGAA 300  
 QY 301 GCTCTTAAGAAAGCACTACTCAAAAGTTCCCAAGAAAGCACTACTGAAAGCTCT 360  
 DB 301 GCTCTTAAGAAAGCACTACTCAAAAGTTCCCAAGAAAGCACTACTGAAAGCTCT 360  
 QY 361 AAGAAAGCACTACTCAAAAGTTCCCAAGAAAGTTCCCAAGAAAGCACTACTGAA 420  
 DB 361 AAGAAAGCACTACTCAAAAGTTCCCAAGAAAGTTCCCAAGAAAGCACTACTGAA 420  
 QY 421 GCTCTTAAGAAAGCACTACTCAAAAGTTCCCAAGAAAGTTCCCAAGAAAGCACT 480  
 DB 421 GCTCTTAAGAAAGCACTACTCAAAAGTTCCCAAGAAAGTTCCCAAGAAAGCACT 480  
 QY 481 TACTGGATGTGTGAAGCTTCTTGGAAGTGGCGGTAAGGCTGATGCACTCCCT 540  
 DB 481 TACTGGATGTGTGAAGCTTCTTGGAAGTGGCGGTAAGGCTGATGCACTCCCT 540  
 QY 541 GTTGGCTCTGTGAAGGATGTGAAGCTTCTGTGATGAACAACCTCAAAAGGCTGT 600  
 DB 541 GTTGGCTCTGTGAAGGATGTGAAGCTTCTGTGATGAACAACCTCAAAAGGCTGT 600  
 QY 601 GTTGGGTGAGAGCTACACCTGTATGATCAATCAATCACTTGGTGTGAGAGGACT 660  
 DB 601 GTTGGGTGAGAGCTACACCTGTATGATCAATCAATCACTTGGTGTGAGAGGACT 660  
 QY 661 GCTTACGTTTGGCGGCTCTTCAATTTCTGTGATGAGAGGACTTGGTGTGAGG 720  
 DB 661 GCTTACGTTTGGCGGCTCTTCAATTTCTGTGATGAGAGGACTTGGTGTGAGG 720  
 QY 721 TGTTCGAACTCACTCACTTCACTGCGGTCAAGGATGAAGAGTGTGTTCAAGTA 780  
 DB 721 TGTTCGAACTCACTCACTTCACTGCGGTCAAGGATGAAGAGTGTGTTCAAGTA 780

QY 781 ACCAACAAGTGTGATCTGACCTTGTGCTTACACTGGGCTCACTTGTACCTCAATGCCC 840  
 DB 781 ACCAACAAGTGTGATCTGACCTTGTGCTTACACTGGGCTCACTTGTACCTCAATGCCC 840  
 QY 841 GGTGGGTGTGATCTGACCTTGTGCTTACACTGGGCTCACTTGTACCTCAATGCCC 900  
 DB 841 GGTGGGTGTGATCTGACCTTGTGCTTACACTGGGCTCACTTGTACCTCAATGCCC 900  
 QY 901 TGGGGTCAAGTATCGCGGCTTCTTCTGCTGCTGACCTGTTCTCACTTCTTCTGCC 960  
 DB 901 TGGGGTCAAGTATCGCGGCTTCTTCTGCTGCTGACCTGTTCTCACTTCTTCTGCC 960  
 QY 961 CTTCAGCTGTGTGATGATGAGATTCGCTGTTCAAAAGCGGTATTAACCAACCATG 1020  
 DB 961 CTTCAGCTGTGTGATGATGAGATTCGCTGTTCAAAAGCGGTATTAACCAACCATG 1020  
 QY 1021 ACCTACAAAGTATCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1080  
 DB 1021 ACCTACAAAGTATCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1080  
 QY 1081 TAA 1083  
 DB 1081 TAA 1083

# RESULT 2

AA143246  
 AA143246 standard; DNA; 1083 BP.

AA143246;

22-AUG-2002 (first entry)

Rhizopus arrhizus endoglucanase-related coding sequence 3.

Zygomycetes-originated endoglucanase; cellulose binding domain;  
 fibre processing; waste paper de-linking; paper pulp; ds; gene.

Rhizopus arrhizus.

WO200242474-A1.

30-MAY-2002.

21-NOV-2001; 2001WO-JP10188.

21-NOV-2000; 2000JP-0354296.

(MEIJ) MEIJI SEIKA KAISHA LTD.

Nakane A, Baba Y, Koga J, Kubota H;

WPI: 2002-471729/50.

P-PSDB; AAO15054.

Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,  
 with effect of endoglucanase activity enhanced in processing fibers,  
 deinking waste paper and improving freeness of paper pulp

Disclousure; Page 65-68; 109pp; Japanese.

The invention comprises the amino acid and coding sequences of  
 CC zygomycetes-originated endoglucanase enzymes lacking the cellulose  
 CC binding domain. The zygomycetes-originated endoglucanase enzymes  
 CC invention have enhanced endoglucanase activity. The zygomycetes-  
 CC originated endoglucanase enzymes of the invention are useful for  
 CC processing fibers, de-linking waste paper and improving the freeness of  
 CC paper pulp - which is particularly applicable in detergent compositions.  
 CC The present DNA sequence represents an endoglucanase-related gene  
 CC sequence of the invention.

Sequence 1083 BP; 260 A; 297 C; 231 G; 295 T; 0 other;

Query Match 100.0%; Score 1083; DB 24; Length 1083;  
 Best Local Similarity 100.0%; Pred. No. 5.6e-302;  
 Matches 1083; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

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QY 1 ATGAAGTTCCTTACCAATGCTCTCCGCTATCTTGGCACTTCCGCTGACTGAATG 60
DB 1 ATGAAGTTCCTTACCAATGCTCTCCGCTATCTTGGCACTTCCGCTGACTGAATG 60
QY 61 GCCCATGCTGTAATGATGAGCAAGCTTACCAATGCTGCTGAAGAACTGGGAATGA 120
DB 61 GCCCATGCTGTAATGATGAGCAAGCTTACCAATGCTGCTGAAGAACTGGGAATGA 120
QY 121 CCTACCTGCTGTAATGCTGCTCTACTTGGCTGATTAATCCCTGCAATCCCTTCTACTCC 180
DB 121 CCTACCTGCTGTAATGCTGCTCTACTTGGCTGATTAATCCCTGCAATCCCTTCTACTCC 180
QY 181 CAATGCTTCCCAATGAAACCTGCACTCACTAACAATCTTCTCAAAAACCACT 240
DB 181 CAATGCTTCCCAATGAAACCTGCACTCACTAACAATCTTCTCAAAAACCACT 240
QY 241 ACTGAGGTGCAAGAACTACCACTAAGGTTCAAGAAACCACTCACTGAA 300
DB 241 ACTGAGGTGCAAGAACTACCACTAAGGTTCAAGAAACCACTCACTGAA 300
QY 301 GCTCTTAAGAAACCACTCACTGAAAGCTTCAAGAAACCACTCACTGAAAGCTCT 360
DB 301 GCTCTTAAGAAACCACTCACTGAAAGCTTCAAGAAACCACTCACTGAAAGCTCT 360
QY 361 AAGAAGACCACTACTACTAAGAAAGCTTCACTCTCACTTCTCTCTCTCTCT 420
DB 361 AAGAAGACCACTACTACTAAGAAAGCTTCACTCTCACTTCTCTCTCTCTCTCT 420
QY 421 GCTTCTCAAACTACTCGCTGCTCTCTGCTGCTGCTCGGTAATGTAACCACTGCG 480
DB 421 GCTTCTCAAACTACTCGCTGCTCTCTGCTGCTGCTCGGTAATGTAACCACTGCG 480
QY 481 TACTGGGATTTGTAAGCCCTTCTGCAAGTGGCCGGTAAGGCTGACCTCCCT 540
DB 481 TACTGGGATTTGTAAGCCCTTCTGCAAGTGGCCGGTAAGGCTGACCTCCCT 540
QY 541 GTTGGCTCTGTAACAAGATGTAAGATCTTGGCTGTAACAACAACAACAAGGCTGT 600
DB 541 GTTGGCTCTGTAACAAGATGTAAGATCTTGGCTGTAACAACAACAACAAGGCTGT 600
QY 601 GTTGGCTCTGTAACAAGATGTAAGATCTTGGCTGTAACAACAACAACAAGGCTGT 660
DB 601 GTTGGCTCTGTAACAAGATGTAAGATCTTGGCTGTAACAACAACAACAAGGCTGT 660
QY 661 GCTTACGCTTTCGCGCTGCTTCACTTCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 720
DB 661 GCTTACGCTTTCGCGCTGCTTCACTTCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 720
QY 721 TGTTCGAATCACTTCACTTCACTTCACTTCACTTCACTTCACTTCACTTCACTT 780
DB 721 TGTTCGAATCACTTCACTTCACTTCACTTCACTTCACTTCACTTCACTTCACTT 780
QY 781 ACCAAGCTGCTTCACTTCACTTCACTTCACTTCACTTCACTTCACTTCACTT 840
DB 781 ACCAAGCTGCTTCACTTCACTTCACTTCACTTCACTTCACTTCACTTCACTT 840
QY 841 GGTGCTGCTTGTGTAATGTAAGATGTAAGATGTAAGATGTAAGATGTAAGATGTA 900
DB 841 GGTGCTGCTTGTGTAATGTAAGATGTAAGATGTAAGATGTAAGATGTAAGATGTA 900
QY 901 TGGGGTGAAGATAGCGGGGCTTCTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 960
DB 901 TGGGGTGAAGATAGCGGGGCTTCTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 960
QY 961 CTTCAAGCTGCTGTAAGATGTAAGATGTAAGATGTAAGATGTAAGATGTAAGATGTA 1020
DB 961 CTTCAAGCTGCTGTAAGATGTAAGATGTAAGATGTAAGATGTAAGATGTAAGATGTA 1020

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QY 1021 ACCTACAAAGTAACTGCTCCCAAGGCTATGACTCCCAAGTCTGCTGCAAGAAA 1080
DB 1021 ACCTACAAAGTAACTGCTCCCAAGGCTATGACTCCCAAGTCTGCTGCAAGAAA 1080
QY 1081 TAA 1083
DB 1081 TAA 1083

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## RESULT 3

AAA62726 standard; DNA; 1017 BP.

AAA62726;

25-SEP-2000 (first entry)

Endoglucanase nucleotide sequence 1.

Endoglucanase; cellulose breakdown; produce pulp; papermaking;

animal foodstuff; ss.

Rhizopus oryzae.

WO200024879-A1.

04-MAY-2000.

25-OCT-1999; 99WO-JP05884.

23-OCT-1998; 98JP-0302387.

(MEIJ) MEIJI SEIKA KAISHA LTD.

Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;

Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;

WPI: 2000-365117/31.

P-PSDB; AAB09821.

Endoglucanases of fungal origin with high activity under alkaline

conditions for production of paper pulp and animal feedstuffs

Claim 44; Page 104-105; 180pp; Japanese.

This sequence encodes an endoglucanase protein. The invention relates to an endoglucanase of fungal origin which can completely break down purified cellulose at a concentration of less than 1mg protein/litre, and produces more than 50% breakdown of cellulose at pH 8.5. The invention includes endoglucanase protein sequences (see AA09825-B09830), endoglucanase nucleotide sequences (see AA62726-A62732) and primers (AA62733-A62802) which are used in the identification of the endoglucanase sequences, and in the construction of vectors containing the polynucleotides. The endoglucanase enzymes are used for the production of pulp for papermaking and for the production of animal foodstuffs.

Sequence 1017 BP; 240 A; 250 C; 235 G; 292 T; 0 other;

Query Match 47.9%; Score 519.2; DB 21; Length 1017;  
 Best Local Similarity 71.9%; Pred. No. 2.3e-139;  
 Matches 781; Conservative 0; Mismatches 233; Indels 72; Gaps 5;

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QY 1 ATGAAGTTCCTTACCAATGCTCTCCGCTATCTTGGCACTTCCGCTGACTGAATG 60
DB 1 ATGAAGTTCCTTACCAATGCTCTCCGCTATCTTGGCACTTCCGCTGACTGAATG 60
QY 61 GCCCATGCTGTAATGATGAGCAAGCTTACCAATGCTGCTGAAGAACTGGGAATGA 120
DB 61 GCCCATGCTGTAATGATGAGCAAGCTTACCAATGCTGCTGAAGAACTGGGAATGA 120
QY 121 CCTACCTGCTGTAATGCTGCTCTACTTGGCTGATTAATCCCTGCAATCCCTTCTACTCC 180
DB 121 CCTACCTGCTGTAATGCTGCTCTACTTGGCTGATTAATCCCTGCAATCCCTTCTACTCC 180

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Db      121 CCTACTGTTGTAATCGATCCACTG-----TAAAGTAAGCAAGATTACTCT 174
Qy      181 CAATGTTTCCCAATGAAAACTCCTCCACTAACAAATCTTCAAAAAACACACT 240
Db      175 CAATGTTTCCCTCTGGAAGCAGTGSC-----ATAAATCT 210
Qy      241 ACTGAGAGGCCAAGAAAGTCCACTACTTAAAGTTCCAGAAAGCACCACTACTGAA 300
Db      211 TCTGAAAGTCTCAAGAAAGTACCTGCTGCTCAAGAAAG----- 255
Qy      301 GCCTTAAGAAAGCACCACTACTGAGCTTCCAGAAAGACCACTACTGAGCTCT 360
Db      256 -----ACTACTACCGCTGCTCAAAAAAGTCACTACTGCTCTCT 297
Qy      361 AAGAAGACCACTACTACTAGAAAGGCTTCACTCTCACTCTCTCTCTCTCTCT 420
Db      298 AAGAAGACTCAAACTGTTGCCAA-----AGCTTCAACCCCTTCACTAGCTTAC 351
Qy      421 GCTTCTACAAACTCCGCTGCTCTGAGGAGGCTCCGAGTAAAGTAAACCACTG 480
Db      352 TCCAGCGGCAAAATTCGCTGCTCTGAGGAGGCTCTGAGTACGCTCACTACT 411
Qy      481 TACTGGGATTTGTTGAAGCTTCTGCAAGTGGCCGAGTAAAGCTGATGCTACCT 540
Db      412 TATGGGATTTGCTGAAGGCTCTGTAAGCTGCGCCGAGTAAAGCTGATGCT 471
Qy      541 GTTGGCTCTGTTAACAAGATGTTAAGTCTTCTGATTAACAACCTCAAAACG 597
Db      472 GTCAAGCTCTGTTAACAAGATGTTAAGTCTTCTGATTAACAAGATGTT 531
Qy      598 TGTGTTGTTGTTAGCAGTACACCTGTTAATGAATCAACCTTGGGTTGTTAG 657
Db      532 TCTTAACGTTGTTAAGTTCATGTTAACAAGAACCACTTGGGCTGTTAACA 591
Qy      658 CTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 717
Db      552 CTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 651
Qy      718 GCTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 777
Db      652 TCTTGTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 711
Qy      778 GTAACCAACACTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 837
Db      712 GTCACTTAACACTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 771
Qy      838 CCCGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 897
Db      772 CCCGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 831
Qy      898 GTTTGGGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 957
Db      832 GTTTGGGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 891
Qy      958 GCCCTTCAAGCTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 1017
Db      892 GCATCTCAAGCTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 951
Qy      1018 ATGACCTTAACAAGTACTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 1077
Db      952 ATGACCTTAACAAGTACTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 1011
Qy      1078 AAATAA 1083
Db      1012 AAATAA 1017

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DT      22-AUG-2002 (first entry)
XX
XX      Rhizopus arrhizus endoglucanase-related coding sequence 1.
DB
XX      Zygomycetes-originated endoglucanase; cellulose binding domain;
KM      fibre processing; waste paper de-inking; paper pulp; ds; gene.
XX
XX      Rhizopus arrhizus.
OS
PN      WO200242474-A1.
XX
PD      30-MAY-2002.
XX
PF      21-NOV-2001; 2001WO-JP10188.
XX
PR      21-NOV-2000; 2000JP-034296.
XX
PA      (MEIJU) MEIJU SEIKA KAISHA LTD.
XX
PI      Nakane A, Baba Y, Koga J, Kubota H;
XX
DR      WPI; 2002-471729/50.
XX
DR      P-PSDB; AA015052.
XX
PT      Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT      with effect of endoglucanase activity enhanced in processing fibers,
XX      deinking waste paper and improving freeness of paper pulp -
XX      Example 10; Page 56-58; 109pp; Japanese.
XX
CC      The invention comprises the amino acid and coding sequences of
CC      zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC      binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC      invention have enhanced endoglucanase activity. The zygomycetes-
CC      originated endoglucanase enzymes of the invention are useful for
CC      processing fibres, de-inking waste paper and improving the freeness of
CC      paper pulp - which is particularly applicable in detergent compositions.
CC      The present DNA sequence represents an endoglucanase-related gene
XX      sequence of the invention.
XX
SQ      Sequence 1017 BP; 240 A; 250 C; 235 G; 292 T; 0 other;

Query Match      47.9%; Score 519.2; DB 24; Length 1017;
Best Local Similarity 71.9%; Pred. No. 2.3e-139;
Matches 781; Conservative 0; Mismatches 233; Indels 72; Gaps 5;

Qy      1 ATGAAGTTCCTTACCATGCTCCTCGCTATCTTGGCACTTGGCGTACTGAATG 60
Db      1 ATGAAGTTATTAATTAATGCTCTTCCGCTCTTGGCTCTGCGCTCGTACTGAATG 60
Qy      61 GCCATGCTGTTGATGATGAGCAAGCTTACTACCAATGTGTGTGAAGAACTGGGATGA 120
Db      61 GCTCTGTGTGATGATGAGCAATGTATGTCAATGTGTGTGAAGAACTGGGATGAGC 120
Qy      121 CCTACCTGCTGATGATGCTGCTTACTGCTTATTAATCTGACATCTTCTACTCC 180
Db      121 CCTACTGTGTGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 174
Qy      181 CAATGTGTTCCCAATGAAAACCTCACCTCACTAAACAATCTTTCACAAAACCACT 240
Db      175 CAATGTCTTCTCTGGAAGAGTGSC-----ATAAATCT 210
Qy      241 ACTGAGAGTGCAGAAAGTACTCACTAATGTTTCAAGAAAGCACCACTACTGAA 300
Db      211 TCTGAAAGTCTCAAGAAAGTACTCACTGCTCTCAAGAAAG----- 255
Qy      301 GCCTTAAGAAAGACCACTACTGAGCTTCCAGAAAGCACCACTACTGAGCTCT 360
Db      256 -----ACTACTACCGCTGCTCAAAAAAGTCACTACTGCTCTCTCT 297
Qy      361 AAGAAGACCACTACTACTAGAAAGGCTTCACTCTCACTCTCTCTCTCTCTCTCT 420
Db      298 AAGAAGACTCAAACTGTTGCCAA-----AGCTTCAACCCCTTCACTAGCTTAC 351

```



Db 595 GACAGCATGTCCAAAGTGGCTGTACGCTGTACAGTTACATGTGTACAGACACAG 654  
 Qy 637 CTTGGGTTGTAGGACGACACCTTGCCTTACGCTTTCGCCCTGCTTCCATTTCTGTGTGT 696  
 Db 655 CTTGGGTTGTAGGACGACACCTTGCCTTACGCTTTCGCCCTGCTTCCATTTCTGTGTGT 714  
 Qy 697 AGCGAAGCTACTTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGG 756  
 Db 715 GGTGAATCTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGG 774  
 Qy 757 GGTGAAGATGT 816  
 Db 775 GGTGAAGATGT 834  
 Qy 817 GCTCACTTGTGCTGCAATATGCCGGGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGT 876  
 Db 835 GCTCACTTGTGCTGCAATATGCCGGGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGT 894  
 Qy 877 CAATGGGGT 936  
 Db 895 CAATGGGGT 954  
 Qy 937 GACTGTCTTACCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCT 996  
 Db 955 GACTGTCTTACCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCT 1014  
 Qy 997 AAAAGGCTGTATACCAACCACTGACCTTCAACCACTGACCTTCAACCACTGACCTTCAACCACT 1056  
 Db 1015 AAAAGGCTGTATACCAACCACTGACCTTCAACCACTGACCTTCAACCACTGACCTTCAACCACT 1074  
 Qy 1057 GCCAAGT 1083  
 Db 1075 GCCAAGT 1101

RESULT 6  
 AAL43245  
 ID AAL43245 standard; DNA; 1101 BP.  
 AC AAL43245;  
 XX 22-AUG-2002 (first entry)  
 DT Rhizopus arrhizus endoglucanase-related coding sequence 2.  
 XX  
 DE Rhizopus arrhizus endoglucanase-related coding sequence 2.  
 KM Zygomyces-originated endoglucanase; cellulose binding domain;  
 KM fibre processing; waste paper de-inking; paper pulp; ds; gene.  
 XX  
 OS Rhizopus arrhizus.  
 XX  
 PN WO200242474-A1.  
 PD 30-MAY-2002.  
 PF 21-NOV-2001; 2001WO-JP10188.  
 PR 21-NOV-2000; 2000JP-0354296.  
 XX  
 PA (MEIJ) MEIJI SEIKA KAISHA LTD.  
 PI Nakane A, Baba Y, Koga J, Kubota H;  
 XX  
 DR MPI; 2002-471729/50.  
 DR P-P8DB; AAO15053.  
 XX  
 PT Cellulose-binding domain-lacking Zygomyces-originated endoglucanase,  
 PT with effect of endoglucanase activity enhanced in processing fibers,  
 PT deinking waste paper and improving freeness of paper pulp -  
 XX  
 PS Disclosure; Page 60-63; 109pp; Japanese.  
 CC The invention comprises the amino acid and coding sequences of  
 CC Zygomyces-originated endoglucanase enzymes lacking the cellulose

CC binding domain. The zygomycetes-originated endoglucanase enzymes of the  
 CC invention have enhanced endoglucanase activity. The zygomycetes-  
 CC originated endoglucanase enzymes of the invention are useful for  
 CC processing fibres, de-inking waste paper and improving the freeness of  
 CC paper pulp - which is particularly applicable in detergent compositions.  
 CC The present DNA sequence represents an endoglucanase-related gene  
 CC sequence of the invention.  
 XX  
 SO Sequence 1101 BP; 268 A; 258 C; 257 G; 318 T; 0 other;

Query Match 47.9%; Score 519; DB 24; Length 1101;  
 Best Local Similarity 69.7%; Pred. No. 2,7e-139;  
 Matches 772; Conservative 0; Mismatches 305; Indels 30; Gaps 4;

Qy 1 ATGAAGTTTCTTACATTTGCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCT 60  
 Db 1 ATGAAGTTTCTTACATTTGCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCT 60  
 Qy 61 GCCATGCTGTGATGT 120  
 Db 61 GCTCTGCTGTGATGT 120  
 Qy 121 CTTACTGTGTGATGT 180  
 Db 121 CTTACTGTGTGATGT 174  
 Qy 181 CAATGTGTGTGATGT 240  
 Db 175 CAATGTGTGTGATGT 234  
 Qy 241 ACTGAGTGTGTGATGT 300  
 Db 235 CAATGTGTGTGATGT 294  
 Qy 301 GCTCTTGAAGACACCACTTGT 351  
 Db 295 GTAAGCAAGATGT 354  
 Qy 352 GAAAGCTTGAAGACACCACTTGT 399  
 Db 355 GAAAGCTTGAAGACACCACTTGT 414  
 Qy 400 ACTTCT 459  
 Db 415 AAAGCTTGAAGACACCACTTGT 474  
 Qy 460 GGTATGTGTGAAGACACCACTTGT 519  
 Db 475 GGTATGTGTGAAGACACCACTTGT 534  
 Qy 520 AAGCTTGAAGACACCACTTGT 576  
 Db 535 AAGCTTGAAGACACCACTTGT 594  
 Qy 577 GATTAACAACCACTTGT 636  
 Db 595 GATTAACAACCACTTGT 654  
 Qy 637 CTTGGGTTGTAGGACGACACCTTGCCTTACGCTTTCGCCCTGCTTCCATTTCTGTGTGT 696  
 Db 655 CTTGGGTTGTAGGACGACACCTTGCCTTACGCTTTCGCCCTGCTTCCATTTCTGTGTGT 714  
 Qy 697 AGCGAAGCTACTTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGG 756  
 Db 715 GGTGAATCTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGGCTGTGG 774  
 Qy 757 GGTGAAGATGT 816  
 Db 775 GGTGAAGATGT 834  
 Qy 817 GCTCACTTGTGCTGCAATATGCCGGGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGT 876  
 Db 835 GCTCACTTGTGCTGCAATATGCCGGGT 894



QY 877 CAATGGGAGTCTCCACCGATGTTGGGGTCAAGATACGG3GGTGTCTTCTGCGCT 936  
 DB 895 CAATGGGAGTCTCCACCGATGTTGGGGTCAAGATACGG3GGTGTCTTCTGCGCT 954  
 QY 937 GACTGTCTAATCTTCTGCTTCCAGCTGTTGTAATGAGATTCGGCTGCTTC 996  
 DB 955 GACTGTCTAATCTTCTGCTTCCAGCTGTTGTAATGAGATTCGGCTGCTTC 1014  
 QY 997 AAAAAAGCTGATTAACCAACCATGACTTACCAAAAGATTACTTCCAGGCTATCACT 1056  
 DB 1015 AAGAACCTGATTAACCAACCATGACTTACCAAAAGATTACTTCCAGGAAATCAACC 1074  
 QY 1057 GCCAAGTCTGCTGCTTCAAGAAATPAA 1083  
 DB 1075 GCCAAGACAGGTGTCTCAAGAAATPAA 1101  
 RESULT 7  
 AAA62729  
 ID AAA62729 standard; DNA; 1017 BP.  
 AC AAA62729;  
 AC 25-SEP-2000 (first entry)  
 DE Endoglucanase nucleotide sequence 4.  
 XX  
 XX Endoglucanase; cellulose breakdown; produce pulp; papermaking;  
 KM animal foodstuff; ss.  
 OS Mucor circinelloides.  
 XX  
 XX WO200024879-A1.  
 XX  
 XX 04-MAY-2000.  
 XX  
 XX 25-OCT-1999; 99WO-JP05884.  
 XX  
 XX 23-OCT-1998; 98JP-0302387.  
 XX  
 XX (MEIJ) MEIJI SEIKA KAISHA LTD.  
 XX  
 XX Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;  
 PI Mutsaers K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;  
 DR WPI; 2000-365117/31.  
 XX  
 XX P-PSDB; AAB09824.  
 XX  
 XX Endoglucanases of fungal origin with high activity under alkaline  
 PT conditions for production of paper pulp and animal feedstuffs -  
 XX  
 XX Claim 44; Page 118-119; 180pp; Japanese.  
 XX  
 XX This sequence encodes an endoglucanase protein. The invention relates  
 CC to endoglucanase of fungal origin which can completely break down  
 CC purified cellulose at a concentration of less than 1mg protein/litre,  
 CC and produces more than 50% breakdown of cellulose at pH 8.5. The  
 CC invention includes endoglucanase protein sequences (see  
 CC AA009825-809830), endoglucanase nucleotide sequences (see  
 CC AA62726-62732) and primers (AA62733-62802) which are used in the  
 CC identification of the endoglucanase sequences, and in the construction of  
 CC vectors containing the polynucleotides. The endoglucanase enzymes are  
 CC used for the production of pulp for papermaking and for the production of  
 CC animal foodstuffs.  
 CC  
 XX Sequence 1017 BP; 233 A; 255 C; 236 G; 293 T; 0 other;  
 SO  
 Query Match 37.4%; Score 404.6; DB 21; Length 1017;  
 Best Local Similarity 65.6%; Pred. No. 2.6e-106;  
 Matches 671; Conservative 0; Mismatches 289; Indels 63; Gaps 3;  
 QY 61 GCCCATGCTGATGTAGCAAGGCTTACTCAATGTGTGTGTAGCAAGTGGGATGCA 120

DB 58 GCTGAAGCTGCTCTTCTGCACTGCTGTATGTCTCAATGTGTGTCATGTGATGAGTGA 117  
 QY 121 CTTAATGCTGTGAATGTGCTCTACTTGGTGTGATTAATCTGACATCTCTTCTACTCC 180  
 DB 118 CTTAATGCTGTGAATGTGCTCTACTTGGTGTGATTAATCTGACATCTCTTCTACTCC 177  
 QY 181 CAATGTGCTCAATGAAACCTCACCTCACTCAATCAATCTTCTCAAAACCAACCACT 240  
 DB 178 CAATGTGCTC-----CGATCCCAAGTAAATGTGTAAACGCTAAGACGACC 228  
 QY 241 ACTGAGTGTCCAGAAAGACTACCACTAATAAGTTTCAAGAAAGACCACTACTGA 300  
 DB 229 AAGAAACATCTACCAAGACATCTACT----- 255  
 QY 301 GCTCTAAGAAAGACCACTACTGAAGCTTCCAAAGAACCACTACTGAAGCTCT 360  
 DB 256 -----ACCAACCGCCAGGCTACTGCTACTGCTACCAACCAAGACGTAACCAAG 303  
 QY 361 AAGAAACCACTACTACTAAGAGGCTTCTACTCTCACTTCTCTCTCTCTCTCTCTCT 420  
 DB 304 ACAACTACCAAGACCACTACCAAGACTACGACTACGCTGCTGCTTCTACTCTCAACCTCT 363  
 QY 421 GCTTCTACCAACTACGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 480  
 DB 364 TCTTCTGCTGCTTACCAAGCTCATCTGCGGCTAAATCTGACAGTGTCTCAACCTCTCT 423  
 QY 481 TACTGGATTTGTATGACCTCTTCTGAGTTGGCCGCTGTAAGCTGATGTCACCTCCCT 540  
 DB 424 TATTGGATTTGTATGAGCTTCTTCTGAGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 483  
 QY 541 GTTGGCTCTGCTTACCAAGAGTGTGTAAGCTCTCTGTAACAACCTCAAAAGGCTGT 600  
 DB 484 GTTACACCTGTGCTCTCAATGTGTATCTCTTATTAATGCTCAATGCTCAAAAGTGTGT 543  
 QY 601 GTTGTGTGTAGCACTACCTGTATGACATCAATCAATCAATCTTGTGTGTGTGTGTGT 660  
 DB 544 AAGGTGTGTATGCTTCTCATGTGTATCAACCAACCTTGTGTGTGTGTGTGTGTGTGT 603  
 QY 661 GCTTACGCTTTCGCGCTGCTCTCATTTCTGTGTGTGTGTGTGTGTGTGTGTGTGTGT 720  
 DB 604 GCTTACGCTTTCGCGCTGCTCTCATTTCTGTGTGTGTGTGTGTGTGTGTGTGTGTGT 663  
 QY 721 TGTTCGAATCAATTCACCTCTACTGCGCTCAAGGCTAAGAGTGTGTGTGTGTGTGT 780  
 DB 664 TGTATGATTTGACCTTCACTTCTGCGCTGCTTGTGAAAGAGATGTGTGTGTGTGTGT 723  
 QY 781 ACCAACAAGTGTGTGACCTTGTCTTACCACTGTGTGTGTGTGTGTGTGTGTGTGTGTGT 840  
 DB 724 ACCAACAAGTGTGTGACCTTGTCTTACCACTGTGTGTGTGTGTGTGTGTGTGTGTGTGT 774  
 QY 841 GGT 900  
 DB 775 GGT 834  
 QY 901 TGGGT 960  
 DB 835 TGGGT 894  
 QY 961 CTTCAAGCTGT 1020  
 DB 895 CTTCAAGCTGT 954  
 QY 1021 ACTTCAAGCAAGT 1080  
 DB 955 ACTTCAAGCAAGT 1014  
 QY 1081 TAA 1083  
 DB 1015 TAA 1017  
 RESULT 8

AA143247  
 ID AA143247 standard; DNA; 1017 BP.  
 AC AA143247;  
 DT 22-AUG-2002 (first entry)  
 XX Rhizopus arrhizus endoglucanase-related coding sequence 4.  
 XX  
 DE Rhizopus arrhizus endoglucanase-related coding sequence 4.  
 XX  
 KM Zygomycetes-originated endoglucanase; cellulose binding domain;  
 XX fibre processing; waste paper de-linking; paper pulp; ds; gene.  
 OS Mucor circinelloides.  
 PN MO200242474-A1.  
 XX  
 PD 30-MAY-2002.  
 XX  
 PF 21-NOV-2001; 2001MO-JP10188.  
 XX  
 PR 21-NOV-2000; 2000JP-0354296.  
 XX  
 PA (MEIJ) SEIKA KAISHA LTD.  
 XX  
 PI Nakane A, Baba Y, Koga J, Kubota H;  
 XX WPI; 2002-471729/50.  
 DR P-PSDB; AAO15055.  
 XX  
 PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,  
 XX with effect of endoglucanase activity enhanced in processing fibers,  
 PT deinking waste paper and improving freeness of paper pulp -  
 XX  
 PS Disclosure; Page 70-73; 109pp; Japanese.  
 XX  
 CC The invention comprises the amino acid and coding sequences of  
 CC zygomyces-originated endoglucanase enzymes lacking the cellulose  
 CC binding domain. The zygomyces-originated endoglucanase enzymes of the  
 CC invention have enhanced endoglucanase activity. The zygomyces-  
 CC originated endoglucanase enzymes of the invention are useful for  
 CC processing fibres, de-linking waste paper and improving the freeness of  
 CC paper pulp - which is particularly applicable in detergent compositions.  
 CC The present DNA sequence represents an endoglucanase-related gene  
 CC sequence of the invention.  
 XX  
 SQ Sequence 1017 BP; 233 A; 255 C; 236 G; 293 T; 0 other;  
 Query Match 37.4%; Score 404.6; DB 24; Length 1017;  
 Best Local Similarity 65.6%; Pred. No. 2.6e-106;  
 Matches 671; Conservative 0; Mismatches 289; Indels 63; Gaps 3;  
 QY 61 GCCCATGCTGCTGATGATGCAAGGCTTACTACCAATGCTGCTGATGAACTGGGATGA 120  
 DB 58 GGTGAAGCTGCTTCTTGCAGCTCTGTCTATGCTCAATGCTGATGATGATGATGGA 117  
 QY 121 CCTACCTGCTGATGATGCTGCTTACTGCTGATGATGATGATGATGATGATGATGAT 180  
 DB 118 CCTACCTGCTGATGATGCTGCTTACTGCTGATGATGATGATGATGATGATGATGAT 177  
 QY 181 CATGTGCTGCTGATGATGCTGCTTACTGCTGATGATGATGATGATGATGATGATGAT 240  
 DB 178 CATGTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 228  
 QY 241 ACTGAGAGTGCAGAGAGTACCTACCTACTAAAGGTTCAAGAGAGAGAGAGAGAGAGAG 300  
 DB 229 AAGAGAGAGTACCTACCTACTAAAGGTTCAAGAGAGAGAGAGAGAGAGAGAGAGAG 255  
 QY 301 GCCTTAAAG 360  
 DB 256 AAG 303  
 QY 361 AAG 420

DB 304 ACAAATACCAAG 363  
 QY 421 GCTTCAAG 480  
 DB 364 TCTTCTGCTGCTGATGATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 423  
 QY 481 TACTGAGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 540  
 DB 424 TATGAGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 483  
 QY 541 GTTGGCTGCTGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 600  
 DB 484 GTTGGCTGCTGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 543  
 QY 601 GTTGGCTGCTGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 660  
 DB 544 AAG 603  
 QY 661 GCTTACGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 720  
 DB 604 GCTTACGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 663  
 QY 721 TGTGAG 780  
 DB 664 TGTGAG 723  
 QY 781 ACCAAG 840  
 DB 724 ACCAAG 774  
 QY 841 GGTGAG 900  
 DB 775 GGTGAG 834  
 QY 901 TGGGAG 960  
 DB 835 TGGGAG 894  
 QY 961 CTTCAAG 1020  
 DB 895 CTTCAAG 954  
 QY 1021 ACCAAG 1080  
 DB 955 ACCAAG 1014  
 QY 1081 TAA 1083  
 DB 1015 TAA 1017  
 RESULT 9  
 ID AAA62730 standard; DNA; 1164 BP.  
 AC AAA62730;  
 DT 25-SEP-2000 (first entry)  
 XX  
 DE Endoglucanase nucleotide sequence 5.  
 XX  
 KM Endoglucanase; cellulose breakdown; produce pulp; papermaking;  
 XX animal foodstuff; ss.  
 OS Mucor circinelloides.  
 PN MO200024879-A1.  
 XX  
 PD 04-MAY-2000.  
 XX  
 PF 25-OCT-1999; 99MO-JP05884.  
 XX  
 PR 23-OCT-1998; 98JP-0302387.

XX (MEIJ ) MEIJI SEIKA KAISHA LTD.  
 PA Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;  
 PI Muraishima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;  
 XX WPI: 2000-365117/31.  
 DR P-PSDB; AAB09825.  
 XX  
 PT Endoglucanases of fungal origin with high activity under alkaline  
 PT conditions for production of paper pulp and animal feedstuffs  
 XX  
 PS Claim 44; Page 122-124; 180pp; Japanese.  
 CC This sequence encodes an endoglucanase protein. The invention relates  
 CC to an endoglucanase of fungal origin which can completely break down  
 CC purified cellulose at a concentration of less than 1mg protein/litre,  
 CC and produces more than 50% breakdown of cellulose at pH 8.5. The  
 CC invention includes endoglucanase protein sequences (see  
 CC AAB09825-B09830), endoglucanase nucleotide sequences (see  
 CC AAB62726-A62732) and primers (AAB62733-A62802) which are used in the  
 CC identification of the endoglucanase sequences, and in the construction of  
 CC vectors containing the polymynucleotides. The endoglucanase enzymes are  
 CC used for the production of pulp for papermaking and for the production of  
 CC animal foodstuffs.  
 XX  
 SQ Sequence 1164 BP; 272 A; 289 C; 266 G; 337 T; 0 other;  
 Query Match 36.8%; Score 398.6; DB 21; Length 1164;  
 Best Local Similarity 65.6%; Pred. No. 1.5e-104;  
 Matches 662; Conservative 0; Mismatches 284; Indels 63; Gaps 3;  
 QY 75 ATGTAGCAAGCTTACTACCAATGTGTGTAAGCACTGGAAGCTTACTGCTGTGA 134  
 DB 219 ATGTAGTTCGCTATAGTCAATGCGGTGCAATGGAAGCTTACTGCTGTGA 278  
 QY 135 ATCTGGCTTACTGCTGCTGATTAATCTGACAACTCTTCTACTCCCAATGTTCCAA 194  
 DB 279 AAGTGGCTTACTGCTGCTGATTAATCTGACAACTCTTCTACTCCCAATGTTCC 335  
 QY 195 TGAAGCTTACTGCTGCTGATTAATCTGACAACTCTTCTACTCCCAATGTTCCAA 254  
 DB 336 -----CGGATCCCAAGTAAATGCTGTGACGCTGACGACCAAGAGACATCTAC 389  
 QY 255 GAAGACTACCACTAAGGTTCCAGAAAGCAACCACTACTGAAAGCTTAAAGAAC 314  
 DB 390 CAAAGCACTTACT-----AC 404  
 QY 315 CACCACTACTGAAGCTTCAAGAAAGCAACCACTACTGAAGCTTCAAGAAAGCAAC 374  
 DB 405 CACCGCCAAAGCTTACTGCTGATTAATCTGACAACTCTTCTACTCCCAATGTTCC 464  
 QY 375 TACTACTAAGAGGCTTCTACTCTTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCT 434  
 DB 465 AACTACCAAGACTGACACTACTGCGGCTGCTTCTCTCTCTCTCTCTCTCTCTCT 524  
 QY 435 CTCCGCTCTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 494  
 DB 525 CAAAGCTATCTTGGCGGTAAATCTGCGCAAGTGTCCCAACTCTCTTATTTGGATTTG 584  
 QY 495 TAAAGCTTCTTGGCGGTAAATCTGCGCAAGTGTCCCAACTCTCTTATTTGGATTTG 554  
 DB 585 TAAAGCTTCTTGGCGGTAAATCTGCGCAAGTGTCCCAACTCTCTTATTTGGATTTG 644  
 QY 555 CAAAGCTTCTTGGCGGTAAATCTGCGCAAGTGTCCCAACTCTCTTATTTGGATTTG 614  
 DB 645 CTCGAAATGATCTCTTATTTAGATGCAATGCTCAAGTGTGTAAACGGGTGAATGG 704  
 QY 615 CTACACCTGATATGACATCAACTTGGGTGTGTAAGCAACACTTGGCTTACGTTTGGC 674  
 DB 705 TTTTATGTGTAAACAACAACCTTGGGTGTGTAAGCAACACTTGGCTTACGTTTGGC 764  
 QY 675 CGCTGCTTCAATTTCTGTGTGTAAGCAACACTTGGGTGTGTAAGCAACACTTGGC 734

DB 765 TGCTGCTTATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 824  
 QY 735 ATTCACCTTACTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 794  
 DB 825 CTTCACCTTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 884  
 QY 795 TGACCTTGGCTTCAACACTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 854  
 DB 885 CGATTAGGCTTCAAC-----CACTTGAATTTGCAAAATGCGCGGTGCTGCTG 935  
 QY 855 TATCTAAGATGTTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 914  
 DB 936 TATCTAAGATGTTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 995  
 QY 915 CGGCGGTGTTCTTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 974  
 DB 996 TGTGTGTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 1055  
 QY 975 TAAAGTGAATTCGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 1034  
 DB 1056 TAAATGAGATTCACCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 1115  
 QY 1035 TACCTGTCCAAAGGCTATCACTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 1083  
 DB 1116 TACCTGTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 1164  
 RESULT 10  
 AAL43248  
 ID AAL43248 standard; DNA; 1164 BP.  
 XX  
 AC AAL43248;  
 XX  
 DT 22-AUG-2002 (first entry)  
 XX  
 DE Rhizopus arrhizus endoglucanase-related coding sequence 5.  
 XX  
 KW Zygomycetes-originated endoglucanase; cellulose binding domain;  
 KW fibre processing; waste paper de-inking; paper pulp; ds; gene.  
 OS  
 XX Mucor circinelloides.  
 PN  
 XX MO200242474-A1.  
 PD  
 XX 30-MAY-2002.  
 XX  
 PF 21-NOV-2001; 2001WO-JP10188.  
 XX  
 PR 21-NOV-2000; 2000JP-0354296.  
 XX  
 PA (MEIJ ) MEIJI SEIKA KAISHA LTD.  
 PI Nakane A, Baba Y, Koga J, Kubota H;  
 XX  
 DR WPI: 2002-471729/50.  
 XX  
 P-PSDB; AAO15056.  
 XX  
 PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,  
 PT with effect of endoglucanase activity enhanced in processing fibers,  
 PT deinking waste paper and improving freeness of paper pulp -  
 PS Disclosure; Page 75-78; 109pp; Japanese.  
 XX  
 CC The invention comprises the amino acid and coding sequences of  
 CC zygomycetes-originated endoglucanase enzymes lacking the cellulose  
 CC binding domain. The zygomycetes-originated endoglucanase enzymes of the  
 CC invention have enhanced endoglucanase activity. The zygomycetes-  
 CC originated endoglucanase enzymes of the invention are useful for  
 CC processing fibres, de-inking waste paper and improving the freeness of  
 CC paper pulp - which is particularly applicable in detergent compositions.  
 CC The present DNA sequence represents an endoglucanase-related gene  
 CC sequence of the invention.

XX Sequence 1164 BP; 272 A; 289 C; 266 G; 337 T; 0 other;  
 SQ Query Match 36.8%; Score 398.6; DB 24; Length 1164;  
 Best Local Similarity 65.6%; Pred. No. 1.5e-104;  
 Matches 662; Conservative 0; Mismatches 284; Indels 63; Gaps 3;

75 ATGTGCAAGGCTTCTACCATGTGTGTAAGAACTGGAAGTGAACCTGCTGTGA 134  
 DB ATGTGCTCGTCTATGTAAGTGGGAGGCTTGAATGAGTGAAGTGAAGTGA 278  
 219 ATGTGCTCGTCTATGTAAGTGGGAGGCTTGAATGAGTGAAGTGAAGTGA 278  
 135 ATGTGCTCGTCTATGTAAGTGGGAGGCTTGAATGAGTGAAGTGAAGTGA 194  
 DB ATGTGCTCGTCTATGTAAGTGGGAGGCTTGAATGAGTGAAGTGAAGTGA 335  
 279 ATGTGCTCGTCTATGTAAGTGGGAGGCTTGAATGAGTGAAGTGAAGTGA 335  
 195 TGAAGGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 254  
 DB TGAAGGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 389  
 336 TGAAGGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 389  
 255 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 314  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 404  
 390 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 404  
 315 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 374  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 464  
 405 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 464  
 375 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 434  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 524  
 465 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 524  
 435 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 494  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 584  
 525 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 584  
 495 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 554  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 644  
 585 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 644  
 555 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 614  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 704  
 645 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 704  
 615 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 674  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 764  
 705 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 764  
 675 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 734  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 824  
 765 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 824  
 735 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 794  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 884  
 825 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 884  
 795 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 854  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 935  
 885 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 935  
 855 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 914  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 995  
 936 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 995  
 915 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 974  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 1055  
 996 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 1055  
 975 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 1034  
 DB GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 1115  
 1056 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 1115  
 1035 GAAGTGAAGGCTTGAAGTGGGAGGCTTGAAGTGGGAGGCTTGAAGTGG 1083

DB 1116 TACCTGTCTGCTGAATTAATTAATTAATTAATTAATTAATTAATTA 1164  
 RESULT 11  
 ID AAA62731 standard; DNA; 1041 BP.  
 AAA62731;  
 25-SEP-2000 (first entry)  
 DE Endoglucanase nucleotide sequence 6.  
 DE Endoglucanase; cellulose breakdown; produce pulp; papermaking;  
 KW animal foodstuff; ss.  
 XX Phycomyces nitens.  
 OS WO200024879-A1.  
 EN 04-MAY-2000.  
 PD 25-OCT-1999; 99MO-JP05884.  
 PE 23-OCT-1998; 98JP-0302387.  
 FR (MEIJU) MEIJU SEIKA KAISHA LTD.  
 PA Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T,  
 PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;  
 XX WPI: 2000-365117/31.  
 DR P-PSDB; AAB09826.  
 XX Endoglucanases of fungal origin with high activity under alkaline  
 PT conditions for production of paper pulp and animal feedstuffs -  
 PS Claim 44; Page 128-129; 180pp; Japanese.  
 XX This sequence encodes an endoglucanase protein. The invention relates  
 CC to an endoglucanase of fungal origin which can completely break down  
 CC purified cellulose at a concentration of less than 1mg protein/litre,  
 CC and produces more than 50% breakdown of cellulose at pH 8.5. The  
 CC invention includes endoglucanase protein sequences (see  
 CC AAB09825-809830), and primers (AAA62733-A62802) which are used in the  
 CC identification of the endoglucanase sequences, and in the construction of  
 CC vectors containing the endoglucanase sequences. The endoglucanase enzymes are  
 CC used for the production of pulp for papermaking and for the production of  
 CC animal foodstuffs.  
 CC  
 SQ Sequence 1041 BP; 225 A; 352 C; 248 G; 216 T; 0 other;  
 Query Match 33.6%; Score 363.4; DB 21; Length 1041;  
 Best Local Similarity 61.3%; Pred. No. 2e-94;  
 Matches 652; Conservative 0; Mismatches 381; Indels 30; Gaps 3;

21 CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 80  
 DB CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 68  
 9 CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 68  
 DB CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 140  
 81 CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 140  
 DB CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 128  
 69 CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 128  
 DB CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 200  
 141 CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 200  
 DB CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 188  
 129 CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 188  
 DB CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 260  
 201 CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 260  
 DB CTCCTCCGCTATCTTGGGACCTTGGGCTGCTGCTGCTGCTGCTGCTGCTG 236  
 189 AGT-----CGAGGTAACTTGAAGTGAAGTGAAGTGAAGTGAAGTGAAG 236

QY 261 TACCACTACTAAAGGTTCCAGAAAGACCACTAAGACCTCTAAGAAAGACCAAC 320  
 Db 237 CACTACACCAAGGCTCTGTCAACCAACCAAGGCCACGACCAACCAACCAAGGC 296  
 QY 321 TACTGAAGCTTCCAGAAAGACCACTAAGAAAGCTCTAAGAAAGACCACTACTAC 380  
 Db 297 CCGTGTCAACCAACCAAGGCTCTAAGAAAGCTCTAAGAAAGACCACTACTAC 356  
 QY 381 TAAGAAAGCTTCTAAGAAAGCTCTAAGAAAGCTCTAAGAAAGCTCTAAGAAAG 440  
 Db 357 CACCAACCAAGGCTCTAAGAAAGCTCTAAGAAAGCTCTAAGAAAGCTCTAAGAAAG 407  
 QY 441 TGTCTGT 500  
 Db 408 CATTTCTGT 467  
 QY 501 TTCTTGCAAGTGGCCCGGTAAAGGCTGATGTACCTCCCTGTGTGTGTGTGTGTGTGT 560  
 Db 468 CTCTTGCGGCTGT 527  
 QY 561 TGTGAAGCTTGT 620  
 Db 528 TGT 587  
 QY 621 CTGTGAAGCAATCAACTGT 680  
 Db 588 GTGCAATGTACCAAGGCTGT 647  
 QY 681 TTCAATTTCTGT 740  
 Db 648 CAGT 707  
 QY 741 CTCTACGCGGT 800  
 Db 708 CAACACTGT 767  
 QY 801 TGT 860  
 Db 768 CAGACCAAC-----CACTTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGT 818  
 QY 861 CAATGT 920  
 Db 819 CAAGGCTGT 878  
 QY 921 TGT 980  
 Db 879 TATTAGCTGT 938  
 QY 981 GAGATGT 1040  
 Db 939 GAGATGT 998  
 QY 1041 TCCCAAGGCTGT 1083  
 Db 999 CCGT 1041  
 RESULT 12  
 AAL43249  
 ID AAL43249 standard; DNA; 1041 BP.  
 AC AAL43249;  
 XX 22-AUG-2002 (first entry)  
 XX Phycomyces nileus endoglucanase-related coding sequence.  
 Db Zygomyces-originated endoglucanase; cellulose binding domain;  
 KM fibre processing; waste paper de-inking; paper pulp; ds; gene.  
 XX Phycomyces nileus.  
 OS  
 XX  
 FN W0200242474-A1.

XX 30-MAY-2002.  
 PD 21-NOV-2001; 2001MO-JP10188.  
 XX 21-NOV-2000; 2000JP-0354296.  
 XX 21-NOV-2000; 2000JP-0354296.  
 XX (MEIJ) MEIJI SEIKA KAISHA LTD.  
 PA Nakane A, Baba Y, Koga J, Kubota H;  
 PI WPI; 2002-471729/50.  
 DR P-PSDB; AA015057.  
 XX Cellulose-binding domain-lacking Zygomyces-originated endoglucanase,  
 PT with effect of endoglucanase activity enhanced in processing fibers,  
 PT deinking waste paper and improving freeness of paper pulp -  
 CC Disclosure; Page 81-83; 109pp; Japanese.  
 CC The invention comprises the amino acid and coding sequences of  
 CC Zygomyces-originated endoglucanase enzymes lacking the cellulose  
 CC binding domain. The Zygomyces-originated endoglucanase enzymes of the  
 CC invention have enhanced endoglucanase activity. The Zygomyces-  
 CC originated endoglucanase enzymes of the invention are useful for  
 CC processing fibres, de-inking waste paper and improving the freeness of  
 CC paper pulp - which is particularly applicable in detergent compositions.  
 CC The present DNA sequence represents an endoglucanase-related gene  
 CC sequence of the invention.  
 XX Sequence 1041 BP; 225 A; 352 C; 248 G; 216 T; 0 other;

Query Match 33.6%; Score 363.4; DB 24; Length 1041;  
 Best Local Similarity 61.3%; Pred. No. 2e-94;  
 Matches 652; Conservative 0; Mismatches 381; Indels 30; Gaps 3;  
 QY 21 CTCTCGGCTGT 80  
 Db 9 CTCATCATGT 68  
 QY 81 CAAGGCTGT 140  
 Db 69 CCAAGGCTGT 128  
 QY 141 CTCTACGCTGT 200  
 Db 129 CTCTACGCTGT 188  
 QY 201 CCTCAGCTGT 260  
 Db 189 AGT-----CAAGGCTGT 236  
 QY 261 TACCACTACTAAAGGTTCCAGAAAGACCACTAAGAAAGCTCTAAGAAAGACCAAC 320  
 Db 237 CACTACACCAAGGCTCTGTCAACCAACCAAGGCCACGACCAACCAACCAAGGC 296  
 QY 321 TACTGAAGCTTCCAGAAAGACCACTAAGAAAGCTCTAAGAAAGACCACTACTAC 380  
 Db 297 CCGTGTCAACCAACCAAGGCTCTAAGAAAGCTCTAAGAAAGACCACTACTAC 356  
 QY 381 TAAGAAAGCTTCTAAGAAAGCTCTAAGAAAGCTCTAAGAAAGCTCTAAGAAAG 440  
 Db 357 CACCAACCAAGGCTCTAAGAAAGCTCTAAGAAAGCTCTAAGAAAGCTCTAAGAAAG 407  
 QY 441 TGTCTGT 500  
 Db 408 CATTTCTGT 467  
 QY 501 TTCTTGCAAGTGGCCCGGTAAAGGCTGATGTACCTCCCTGTGTGTGTGTGTGTGTGT 560  
 Db 468 CTCTTGCGGCTGT 527  
 QY 561 TGTGAAGCTTGT 620

[illegible]

Query Match	33.5%;	Score 362.4;	DB 21;	Length 1043;
Best Local Similarity	62.9%;	Pred. No. 3.8e-94;		
Matches 683;	Conservative	0;	Mismatches 331;	Indels 72;
				Gaps 5;

Oy	1	ATGAAGTTCCTTACCAATTCCTCTCCGGCTATCTTGGCACTTGGCCGCGGTACTGGAATG	60
Db	16	ATGAAGTTCATCATATATGCGCTCTCTCCGCGCTCTTCCCTCCGCTTGGCACTGAATG	75
Oy	61	GCCCATGCTGTGAATGAGCAAGGCTTACTACCAATGTGTGTGAAGACTGGATGGA	120
Db	76	GCTTCGCGCTGTAGTGTCTCAACCTTACGAGACATGCGCGGAAGAATCTGCAACGGC	135
Oy	121	CTTACCTGCTGTGAATCTGCTCTTACTTGGGTGATTATCTTGCAATCCTTTTACTCC	180
Db	136	CCCACTCTGTGAGAGCGGCTCGACCTGCAAGGTCTTCGAATGAC-----TACTTACAGC	189
Oy	181	CAATGTGTCCCATGAAAACCTCACTCCACCTAACAATCTTCTCAAAACCACCACT	240
Db	190	CAGTCCCTGCGGAGCG-----GCTCTGGGGAAACAAGTCG	225
Oy	241	ACTGAGATGCGCAAGAGAATCACTACCTAATAAGGTTCAAAGAACCACTACCTAGAA	300
Db	226	AACGATGTGGGCCACAAAGAACCAACGACCGCTGCCCAAGAAAGACCAACAC-----	278
Oy	301	GCGCTTAAGAAAGACCAACCACTAGAAAGCTTCCAAAGAACCAACCACTACTGAAAGCTCT	360
Db	279	-----CGCGCTCAGAAAGAGCTACGACCGGTCCGCGC	312
Oy	361	AAGAAGACCACCACTACTACTAAGAAGGCTTCTACCTCACTTCTCTTCTTCTTCT	420
Db	313	AAGAAGACCAACGACCGTGCAGAGGCTTCACTCCGTCACACTCAGAGCGTCCGCTTCTG	372
Oy	421	GCTTCTTAACTACTCCGCTCTCTCTGTGTGTGCTCCGGTAATGTGAACCACTCGC	480
Db	373	G-----GAAGATACGCGCTGTACGCGGTGGCGCTAGGGGCAACGGGCTCACTACCCG	426
Oy	481	TACTGGGATGTGTGAAGCTTCTTGCAAGTGTGGCCGGTAAAGCTGATGTCACTTCCCT	540
Db	427	TACTGGGATCTGTGCAAGGCTTGTGCTGTGTGGCCGGCAAGGCTTAACTCAGTCTGCGCT	486
Oy	541	GTGGGCTCTGTAAACAAGATGG--TAAAGCTCTTGTGATTAACAACCTAAACCGC	597
Db	487	GTCAGGTCTGCAACAGACGCGGTCAACCGCTCTTAAAGCATCTCAACCGCCCAATGCCG	546
Oy	598	TGTGTGTGTGTGACGACTACCTGTAAATGAACAATCACTTGGGTGTGACGACAC	657
Db	547	TGCAACGGCGCACTCTTACATGTGTGCAACGACAAACAGCAATGGGCTGTCAACGACAAC	606
Oy	658	CTTGCCATCGGTTGGCGCGCTGCTTCCATTTCTGTGTGTAGCGAAGCTACTTGTGTGTGT	717
Db	607	CTTGCTTACGGTTTGGTGTGCGCTGTGCATTAAGCGGGGTGTGCCAGACCGCGTGTCTGC	666
Oy	718	GCGCTTTTGAACCTCACTACCTCACTGACCGGTCAAGGGGTAAAGAAATGTGTGTCA	777
Db	667	TCTGCTTCAAGTCTCACTTCACTCTCAACGAGGTGTGTGCAAAGAAATGTGTGTCAAG	726
Oy	778	GTAAACAACACTGTGTTTGAACCTTGTCTTAAACCTGTGTGTCTCACTTTTGACTTGCAAAATG	837
Db	727	GTACCAACAACCTGGCGGTGACCTTGGCAGCTGCACCGGTGCCCACTTTCGATCTTCAGATG	786
Oy	838	CCCGGTGTGTGTGTGTATCTCAATATGTGTGTGCCACTCAATGGGGGTGTCTCCACCGAT	897

D <sub>b</sub>	787	CCCCGGCGGCGGCGTCCGGATCTTCACAGGATGCTGTGCCAGTGCGGGGCGTCCCAAGCAGC	846
Q <sub>y</sub>	898	GATTGGGGTGCAGAATATAGGCGGCGTTCCTCTGCTGACTGTGTTCTTAACCTTCCTTCT	957
D <sub>b</sub>	847	GGCTGGGGCTGCGCTACGGCGGCACTACGCTCCGCAACGACTGCTCTCTCTCCCTCCAGC	906
Q <sub>y</sub>	958	GCCCTTCAMGCTGTGTGTAACTGAGATTCGCGCTGTTCAA AAA CGCTGATTA CCGCAAC	1012
D <sub>b</sub>	907	GCCCTCCAGCGCGGCTGCAAGTGGCGCTTCAACTGTGTTCA A AA CGCGCAACAACCGCTCC	966
Q <sub>y</sub>	1018	ATGACCTACAAAACAAGTACTGTCGCCAAGGCTATCACTGC CA AGTCTGGCTGTCAAGA	1077
D <sub>b</sub>	967	ATGACCTACAAAAGAAGTCACTGCGCCCAAGAAGATCACCGCTAAGAACCGGATGCTCGGC	1026
Q <sub>y</sub>	1078	AAATPA 1083	
D <sub>b</sub>	1027	AAGTPA 1032	

RESULT 14  
AAL43250  
ID AAL43250 standard; DNA; 1043 BP

AC	AAL43250;
XX	
DT	22-AUG-2002 (first entry)

DE Rhizopus arrhizus endoglucanase-related codon-optimised DNA sequence.  
XX  
KM Zymoglycetes-originated endoglucanase; cellulose binding domain;  
KM fibre processing; waste paper de-inking; paper pulp; ds; gene.

OS Rhizopus arrhizus.  
OS Synthetic.

PN WO200242474-A1.

PD 30-MAY-2002.

PF 21-NOV-2001; 2001WO-JP10188.

PR 21-NOV-2000; 2000JP-0354296.

PA (MEIJ ) MEIJI SEIKA KAISHA LTD.  
VV

PI Nakane A, Baba Y, Koga J, Kubota H;  
yy

DR WPI; 2002-471729/50.  
 DP B-PEND; AA015053

Cellulose-binding

with correct or endoglucanase activity enhanced in processing of deinking waste paper and improving freeness of paper pulp.

Example 10; Page 84-86; 109pp; Japanese.

The invention comprises the amino acid and coding sequences of xymycetes-originated endoglucanase enzymes lacking the cellulose binding domain. The xymycetes-originated endoglucanase enzymes of the invention have enhanced endoglucanase activity. The xymycetes-originated endoglucanase enzymes of the invention are useful for processing fibres, de-linking waste paper and improving the freeness of paper pulp - which is particularly applicable in detergent compositions. The present DNA sequence represents an endoglucanase-related gene sequence of the invention.

**SQ** Sequence 1043 BP; 212 A; 370 C; 291 G; 170 T; 0 other;

Query Match	33.5%	Score 362.4	DB 24	Length 1043
Best Local Similarity	62.9%	Pred. NO. 3.8e-94		
Matches 683, Conservative	0	Mismatches 331,	Indels 72,	Gaps 5,

Oy	1	ATGAAGTTCCTAACATATGGCTCTCCGCGATATCTGGCACTGCGCGGATCTGAATG	60
Db	16	ATGAAGTTCATCATATGCGCTCTCCGCGCTCTTGGCCTCGCCCTTGGCACTGAATG	75
Oy	61	GCCCATCTGCTGATGTAGCAAGGCTTACTACCAATGTGTGTGAAGACTGGATGGA	120
Db	76	GCCCTCCGCGGTGATGCTCTCCAGCTTATGGAACAGTGGCGGGAAGAACTGGAAAGGC	135
Oy	121	CTAACCCTGTGTGATCTGGCTTACTTTCGTTGATTAATCCTGAATCCTTTTACTCC	180
Db	136	CCCACTGTGCGAGACGGGCTCGACCTGGCAAGGCTCTGAATGAC-----TACTACAGC	189
Oy	181	CAATGTGTCCCAATGAAAACTACCTCCACTACAAATCTTTCTCAAAACACACACT	240
Db	190	CAGGCGCTGCGACG-----GCTCTCGGGAAACAAAGTCG	225
Oy	241	ACTAGAGTGCACAAAGAACTACCACTACTAAGGTTTCAAGAAGACCACTACTGAA	300
Db	226	AGCGATGTGCGCCCAAGAAAGACACGACGCTGCCACAAGAAACACGAC-----	278
Oy	301	GCCCTTAAGAAAGACCACTACTGAAGCTTCCAAAGAACACACACTACTGAAGCTCT	360
Db	279	-----GCGCGCTCAAGAAAGTAAAGACCGCTCCGCGC	312
Oy	361	AAGAAGACCACTACTACTAABAAGCTTATACCTCCACTTCTCTCTCTCTCT	420
Db	313	AAGAAGACCAAGACCGTGCACAAAGCTTTCACCTCGTCAACTGAGACGTCTCTTCG	372
Oy	421	GCTTCTACAAACTACTCCGCTGTCTGTGTGTGTCCTCCGGTAAATGGTGAACCACTGC	480
Db	373	G-----GAAAGTACAGCGCTGTACAGGCGTGGCGCTAGCGGCACACGCGTCACTACCGC	426
Oy	481	TACTGGATTTGTTGAAGCTTCTTGGAGTTGACCGGTAAAGCTGATGTCACTCCCT	540
Db	427	TACTGGACCTGCTCAAGGCTTTCGTGCTGCGGCGCCGGCAAGGCTTAAGTCACTCGCT	486
Oy	541	GTGGCTCTGTACAAAGATG--TAAAGCTTTGTGTATACACACTCAAAACGCG	597
Db	487	GTCAAGTCTGTCAACAAAGAGGGGTCAACGCTTTAGCGCTCAACGCGCACTCCGCG	546
Oy	598	TGTGTGTGTGTACAGCTACACCTGTAAATGACAAATCAACTTGTGGTGTAGGACGAC	657
Db	547	TGCAACGCGGCACTCTTACATGTGCACACACAGCCATGGGCTGTACACGACAC	606
Oy	658	CTTGCCTACGTTTCGCGCGCTTCTTCAATTTCTGTGTAGCAAGCTACTTGTGTTGT	717
Db	607	CTTGCCTTACGTTTCGCGCGCTTTCATTAAGCGGCGGTGGCGAGCGCGTGGTGTGC	666
Oy	718	GCTGTTCGAACCTACATCACTCTTATCTGCGGTCAAGGGTAAAGAGTGTGTTCA	777
Db	667	TCTGTCTGTGAGCTACCTTCACTTCCACAGCCTTGTGCAAGAAATGTGTCTCAG	726
Oy	778	GTAACCAACATGTGTTTGCACCTTGGGCTTAAACCTGTGTCACTTTGACTTGAATG	837
Db	727	GTACACCACTTGGCGGTGACCTTGGGACGTCTGACCGGTGCCACTTTCGATCTCAAGT	786
Oy	838	CCCGGTGTGTGTGTGTATCTAATGTTGTGCCACTCAATGGGGTCTCCACCGAT	897
Db	787	CCCGGCGCGCGGTGCGGATCTTCAACGAGTCTGTCCAGTGGGGGCTCCCAAGAC	846
Oy	898	GTTTGGGTGCAAGATAGCGGGGTGTTCTTCTGCTCTGACTGTCTTAACTTCTTCT	957
Db	847	GGTGTGGGTCTGCGCTACGCGGGGATCAAGCTCCGCAAGCGACTCTCTCTCTCCAGC	906
Oy	958	GCCCTCAAGCTGTGTGTAAATGAGATTCGGCTGTCAAAAACGCTGATTAACCAAC	1017
Db	907	GCCCTCAAGCGCGGTGCAATGGCGCTTCAACTGTGTTCAAGAACGCCGACACCCGTC	966
Oy	1018	ATGACCTAACAAACAGTTACTCTGTCCAAAGCTATCACTGCAAGTCTGCTGTTCAGA	1077
Db	967	ATGACCTAACAGAGGTACCTGCGCCCAAGAGATACCGTTAAGACCGAGTGTCTCGGC	1026
Oy	1078	AAATTA	1083

